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Tenor Manufacturing Test Procedures
Second Generation Tenor AS/AX/AF/DX/BX

WARNING

This test can only be run on MultiPath gateways. If your unit is FXS or FXO only, this procedure will not work reliably.

Introduction

The instructions below are applicable to **Tenor AS/AX/AF/DX/BX**, software release P104-12-17 through the most current software patch.

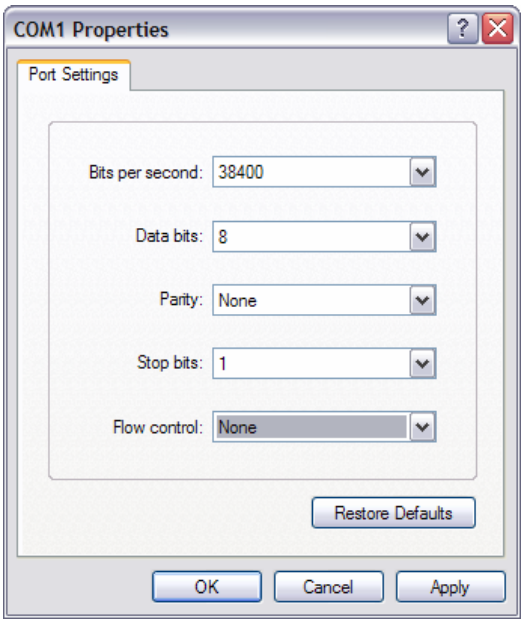
The following procedures should be used anytime that a customer suspects that there is a problem with the Tenor hardware. This test is only to be used for Second Generation Tenor products (**Tenor AS/AX/AF/DX/BX**). This procedure will test the physical interfaces (PHONE/FXS, LINE/FXO, Ethernet) as well as the DSP channels. However, it may not detect all hardware errors.

Please review the following procedures and run the test on each unit prior to contacting Quintum Technical Assistance Center (QTAC) for service. If any of the tests fail, please provide the test report to QTAC for reference.

The steps below are common to all Second Generation Tenor products (**Tenor AS/AX/AF/DX/BX**):

1. Insert the male end of the DB-9 cable into the port labeled *Console*.
2. Insert the female end of the DB-9 cable into your workstation's serial port (see your PC documentation for more information on this port).
3. Open HyperTerminal on your PC and configure it to communicate with the Tenor with the following settings: 38400, 8-N-1, None.

Figure 1. COM1 Properties Dialog



4. Power ON the Tenor.
5. Log in to the Tenor from the console connection.

   Default Username: **admin**

   Default Password: **admin**

Tenor AS/AX/AF Test Procedures

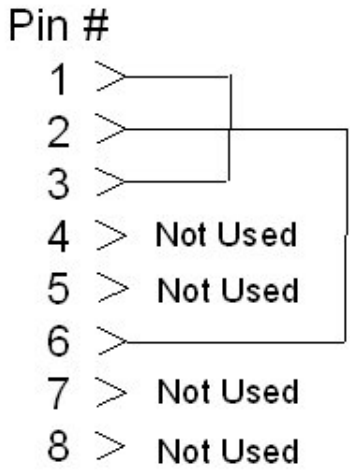
These instructions are for running the manufacturing test on our Analog products (***Tenor AS/AX/AF***). The analog Tenors must complete the boot cycle before the test can be started. **This test can only be run on the Tenor MultiPath ASM/AXM/AFM models**.

NOTE

Complete steps 1-5 in the **Introduction** section before starting.

1. Connect an Ethernet loopback plug to the LAN port. This is an RJ-45 plug that has pin 1 connected to pin 3, and pin 2 to pin 6. See Figure 2 for an example of the wiring.

Figure 2. Wiring for Ethernet Loopback Plug



2. On the Tenor **AS**: Use two 4-wire phone cables (RJ-11 to RJ-11) to connect FXS Port 1/3 to FXO Port 1/3, and FXS Port 2/4 to FXO Port 2/4.

   On the **Tenor AX**: Use the Quintum-supplied RJ-21-to-RJ-21 cable (421-0057-00), or equivalent, to connect the PHONE/FXS port to the LINE/FXO port.

   On the **Tenor AFM**, connect all FXS ports to their corresponding FXO ports using 2-wire or 4-wire RJ-11 to RJ-11 cables, as follows:

   Port 1 to Port 5
   Port 2 to Port 6
   Port 3 to Port 7
   Port 4 to Port 8

NOTE

The Tenor needs to be set to factory defaults and reset before running the manufacturing test. Before setting the unit to factory defaults, save a copy of your database (save contents of /cfg/db folder).

3. Enter configuration mode (type **con <Enter>**). At the **config#** prompt, type **setfactory <Enter>.** A prompt appears to confirm that you want to set the configuration parameters to factory defaults. Type **yes**. The unit will be set to the factory defaults.
4. Enter maintenance mode (type **main <Enter>**). At the **maintain-MasterChassis-1#** prompt, type **reset <Enter>**. A prompt asks you to confirm the reset. Type **yes <Enter>**.

Wait until the Tenor is completely booted up before starting the manufacturing test. It takes approximately 30 seconds from the time you see the Login prompt before the DSPs are initialized and in the "CLOSED" state. From any prompt, type **st dsp <Enter>** to verify that. For more information about these commands, see the *Command Line Interface Guide* on the Quintum website.

5. To start the test: At the ***Quintum>*** prompt, type **cmd mfg start <Enter>**.
6. The manufacturing test runs continuously until stopped. Run it for at least 10 minutes.
7. Type **cmd mfg e <Enter>** to stop the test and obtain results. The results are formatted identically for all the analog units, except for the specific number of lines configured. Errors are displayed on a per-line basis. Results of the test are followed by System Information (version information, serial number, number of cards).

Figure 3. Tenor AX/AS/AF Test Results – Pass Example

```
        ***** Analog Manufacturing Test Results *****


Warmup Duration = 5 seconds

Number of Lines = 4


Line #  Test1(   39)   Test2(   35)   Test3(  171)   Test4(   35)
------  ------------   ------------   ------------   ------------
   1     PASS           PASS           PASS           PASS
   2     PASS           PASS           PASS           PASS
   3     PASS           PASS           PASS           PASS
   4     PASS           PASS           PASS           PASS


        ***** Analog Noise Test Results *****

Line #  SLiC           DAA
------  ------------   ------------
   1      PASS           PASS
   2      PASS           PASS
   3      PASS           PASS
   4      PASS           PASS


Ether 1:       0

ETHERNET TEST RESULTS: PASS

        Packet(s) Sent: 24198
        Packet(s) Received: 24198
        Packet(s) Received with Error: 0
        Packet(s) Lost: 0
```

The following tests are performed.

- **Test 1:** Goes off-hook on FXO lines, checks on FXS lines.
- **Test 2:** Generate Ring on FXS lines, check on FXO lines.
- **Test 3/Test 4:** Test 3 is the same as Test 1. Tests 3 and 4 run as a pair. Goes off-hook on FXO lines and sends DTMF tones in both directions.
- **Ethernet:** Transfers Ethernet packets and verifies packet integrity.

The test repeats the cycle, checking FXO/FXS and DSP cards, and the Ethernet port.

Tenor DX Test Procedures

The following are instructions for running the manufacturing test on the ***Tenor DX.*** In order to run the test, you will need a T1/E1 RJ-45 loopback plug for each populated port (you can also use the red Quintum-supplied T1/E1 cross-over cable). You can make your own T1/E1 loopback plugs by connecting pin 1 to 4, and pin 2 to 5 on your RJ-45 connector.

NOTE

Ensure you have completed steps 1-5 in the **Introduction** section before attempting the procedure below.

1. Connect an Ethernet loopback plug to the LAN port. This is an RJ-45 plug that has pin 1 connected to pin 3, and pin 2 to pin 6. See Figure 2 for the wiring.

   You may also use the Quintum-supplied T1/E1 cross-over cable (303-5010-00) instead of the loopback plugs. Use the T1/E1 cross-over cable to loop back adjacent ports (connect Port 1 to 2, Port 3 to 4, etc.).

2. The Tenor needs to be set to factory defaults before running the manufacturing test, then reset. Before setting the Tenor to factory defaults, save a copy of your database (save contents of /cfg/db folder).

3. At the ***config#*** prompt, type **setfactory <Enter>.** A prompt appears to confirm that you want to set the configuration parameters to factory defaults. Type **yes <Enter>.** The Tenor will be set to the factory defaults**.** At the **maintain-MasterChassis-1#** prompt, type **reset <Enter>.**

   Wait until the Tenor is completely booted up before starting the manufacturing test. It takes approximately 30 seconds from the time you see the Login prompt before the DSPs are initialized and in the “CLOSED” state. From any prompt, type **st dsp <Enter>** to verify that. For more information about these commands, see the *Command Line Interface Guide* on the Quintum website.

4. At the *Quintum*> prompt, type **cmd mfg start <Enter>**.

   The test starts running and provides results. If there are any failures during the test, these are shown on the serial port. The manufacturing test runs continuously until stopped.

5. Run the test for at least 10 minutes.

6. Type **cmd mfg e <Enter>** to stop the test and obtain the results.

Figure 4. Tenor DX Test Results – Pass Example

```
        ***** Digital Manufacturing Test Results *****


Pattern = 0xE, Total Repetitions = 15.77
Intfc 1:        0       Intfc5:         0
Intfc 2:        0       Intfc6:         0
Intfc 3:        0       Intfc7:         0
Intfc 4:        0       Intfc8:         0


Core DSP Errors: 0
DSP 1 Errors: 0
DSP 2 Errors: 0
DSP 3 Errors: 0
Total Dsps in System: 30

Ether 1:        0

ETHERNET TEST RESULTS: PASS

        Packet(s) Sent: 24198
        Packet(s) Received: 24198
        Packet(s) Received with Error: 0
        Packet(s) Lost: 0
```

NOTE

Any test result other than 0 indicates a problem.

Tenor BX Test Procedures

The following are instructions for running the manufacturing test on the ***Tenor BX***. You will need BRI ISDN cross-over cables to loop back the ports on the Tenor prior to running the test (1 cable for a BX204, 2 cables for a BX408, and 4 cables for a BX816).

NOTE

Ensure you have completed steps 1-5 in the **Introduction** section before attempting the procedure below.

1. Connect an Ethernet loopback plug to the LAN port. This is an RJ-45 plug that has pin 1 connected to pin 3, and pin 2 to pin 6. See Figure 2 for the wiring.
2. Connect the Quintum-supplied ISDN BRI Cross-over cable (303-0021-00) between adjacent ports (connect Port 1 to 2, Port 3 to 4, etc.).
3. The unit needs to be set to factory defaults before running the manufacturing test, then reset. Before setting the unit to factory defaults, save a copy of your database (save contents of /cfg/db folder).
4. At the ***config#*** prompt, type **setfactory <Enter>.** A prompt appears to confirm that you want to set the configuration parameters to factory defaults. Type **yes <Enter>.** The Tenor is set to the factory defaults**.** At the **maintain-MasterChassis-1#** prompt, type **reset <Enter>.**
5. At the *Quintum*> prompt, type **cmd mfg start <Enter>.** The test starts running and provides results. If there are any failures during the test, these are shown on the serial port. The manufacturing test runs continuously until stopped.
6. Run the test for at least 10 minutes.
7. Type **cmd mfg e <Enter>** to stop the test and obtain the results.

NOTE

The Tenor BX **must** be reset after the test, and prior to connecting to a live environment.

Figure 5. Tenor BX Test Results – Pass Example

```
        ***** Digital Manufacturing Test Results *****


Pattern = 0x8, Total Repetitions = 9.59
Intfc 1:        0       Intfc5:         0
Intfc 2:        0       Intfc6:         0
Intfc 3:        0       Intfc7:         0
Intfc 4:        0       Intfc8:         0


Core DSP Errors: 0
DSP 1 Errors: 0
DSP 2 Errors: 0
DSP 3 Errors: 0
Total Dsps in System: 30

Ether 1:        0

ETHERNET TEST RESULTS: PASS

        Packet(s) Sent: 24198
        Packet(s) Received: 24198
        Packet(s) Received with Error: 0
        Packet(s) Lost: 0
```

NOTE

Any test result other than 0 indicates a problem.